

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte DEBENDRA DAS SHARMA

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Appeal No. 2002-1498  
Application No. 09/042,202

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HEARD: MARCH 13, 2003

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Before KRASS, JERRY SMITH and BARRETT, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-32.

The invention is directed to a system for managing communications between nodes utilizing credit flow control. A "credit flow control" is used in order to avoid losing data when a queue associated with a destination node is completely full.

In a reactive flow control manner, the destination node tracks its own queues and sends a queue full signal to a sending node when the queue is full. In a proactive flow control manner, the sending node keeps track of the amount of queue space available at the destination queue in the form of "credits" stored in a credit register. Each credit corresponds to a number of entries available at the destination queue. The sending node will then only send data to the destination node when the sending node has sufficient credit. When the destination node clears space in the queue, the destination queue releases credits to the sender, allowing the sender to send more data, as needed. The destination queue stores the number of credits to be released in the debit register.

The problem lies in the initialization of credits in respective registers. Since queue sizes may change over time, with design revisions, the sender nodes cannot assume queue sizes in a destination node. Therefore, upon start-up, the sender will not know how many credits to allocate in the registers for each queue in the destination node. While the prior art initially set the debit and credit registers to zero and then software was used to read the maximum number of credits for each destination node and the number was written into the sender node, the problem

with this approach is alleged to be in the paradox arising from the need for transaction credits to be available in order to perform this credit initialization but the credit initialization cannot take place until credits are available. The solution of the prior art was to use a "power on mode" which allowed all transactions to be sent without using credits but this is alleged to require extra logic and certain minimum queue sizing so that the user needed to have extensive knowledge of the system.

The instant invention is said to overcome these disadvantages by employing the ordinary flow transfer processes of the system. That is, if the sender has credits, then it may send transactions to the destination node. If the destination node has debits, then it releases them back to the sender node. During initialization, the credit register is loaded with a zero so that the sender node begins operation with no credits and no transactions can be sent. The debit register is not loaded with a zero but, rather, with the maximum credits representing the size of its queue. Accordingly, the destination register begins operations with the debit register full and, through normal operations, releases the credits back to the sender node. Then the sender node will have credits and can send transactions and the destination node will have an empty debit register. This is

alleged to result in faster boot times since initialization is completed as soon as the chips are out of their reset state because no time is spent on software operations in a start-up mode.

Representative independent claim 1 is reproduced as follows:

1. A method for initializing credit in a credit register used for flow control that is resident on a first node of a multinode computer system, the method comprising the steps of:

loading an initial credit value into a debit register resident on a second node of the multinode computer system; and

transferring the initial credit value into the credit register by using operational mechanisms of the system.

The examiner relies on the following reference:

Barkey et al. [Barkey]	6,044,406	Mar. 28, 2000
		(filed Apr. 8, 1997)

Claims 1-32 stand rejected under 35 U.S.C. 102(e) as anticipated by Barkey.

Claim 14 stands rejected under 35 U.S.C. 112, second paragraph, as reciting "the step of transferring" on line 6<sup>1</sup> for which there is insufficient antecedent basis.

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<sup>1</sup>It appears that the examiner intended to identify line 5 of claim 14.

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Reference is made to the briefs and answer for the respective positions of appellant and the examiner.

#### OPINION

With regard to the rejection under 35 U.S.C. 112, second paragraph, under this statutory section, the inquiry is whether a claim does, in fact, set out and circumscribe a particular area with a reasonable degree of precision and particularity. It is here where the definiteness of the language employed must be analyzed-not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary skill in the pertinent art. In re Moore, 439 F2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971).

While the examiner protests that there is no antecedent basis for the phrase, "the step of transferring" on line 5 of claim 14, and we do agree that the claim structure is a bit awkward in this regard, we will not sustain this rejection because, after a careful reading of the claim and the specification, it is clear that "the step of transferring" refers to the subsequent paragraph, beginning "transferring the initial

credit value...." Accordingly, while it may be a bit awkward to have the antecedent basis for a recited limitation appear subsequent to, rather than previous to, the recited limitation, the instant claim language does, "in fact, set out and circumscribe a particular area with a reasonable degree of precision and particularity." Accordingly, since the artisan would have clearly understood the nature of the invention from the instant claim language and would clearly have understood as to which limitation "the step of transferring" referred, we will not sustain the rejection of claim 14 under 35 U.S.C. 112, second paragraph.

Under 35 U.S.C. 102, a reference must disclose, explicitly or implicitly, every limitation of the claimed invention. Glaxo Inc. v. Novopharm Ltd., 52 F.3d 1043, 1047, 34 USPQ2d 1565, 1567 (Fed. Cir.), cert. denied, 516 U.S. 988 (1995).

Barkey clearly discloses a credit-based flow control system wherein an initial credit value is loaded into a debit register resident on a second node. In Figure 1, element 34, equivalent to the claimed "debit register," within receiver 14, i.e., second node, is loaded with an initial credit value of n (column 4, lines 39-41). The issue, as we view it, is whether Barkey discloses "transferring the initial credit value into the credit

register by using operational mechanisms of the system," as claimed. In our view, the term, "using operational mechanisms of the system" is broad enough to cover any way Barkey's system transfers the initial credit value into the credit register, if, in fact, Barkey performs such a transfer at all.

The register 30 within sender 12 in Barkey would be the "credit register," as referred to in the claims. From the disclosure at column 4, lines 26-65, of Barkey, it appears that at the time of initialization, an initial credit value of *n* is loaded into the credit register of sender 12 and the same value *n* is loaded into the debit register 34 of the second node, or receiver, 14.

Unlike appellant's invention, Barkey does not appear to disclose that the credit value *n* is initially loaded into the debit register and then the contents of the debit register are transferred to the credit register in sender 12. Rather, Barkey appears to load the same credit value *n* into both the credit and debit registers. Having said that, however, and with a full understanding as to how appellant's *disclosed* invention differs from that of Barker, we now focus on the instant invention, as *claimed*.

With regard to claim 1, there is no requirement that the

contents of the debit register be transferred into the credit register. There is nothing even requiring that anything in the debit register be transferred to the credit register. The claim merely requires that an initial credit value be loaded into a debit register on a second node (Barker clearly does this, at column 4, lines 39-41, wherein an initial credit value of  $n$  is loaded into debit register 34 on second node, or receiver, 14) and "transferring the initial credit value into the credit register...." This latter portion of the claim does not recite transferring the contents of the debit register. In fact, it does not require any connection with the debit register. It merely requires the transferring of the initial credit value (which, in Barker's case, is " $n$ ") into the credit register. Since the initial credit value of  $n$  is "transferred" into the credit register 30 of sender 12, no matter where from, the terms of the claim are met.

Accordingly, we will sustain the rejection of claim 1 under 35 U.S.C. 102(e) and also the rejection of claim 4 since the merits of this claim are not separately argued.

Similarly, since independent claim 17 is merely the apparatus counterpart to method claim 1 and includes similar language, we will also sustain the rejection of claim 17, and of

claim 20, dependent therefrom, and not separately argued, under 35 U.S.C. 102(e).

With regard to independent claims 14 and 30, we take a different view. These claims include an intermediate step of, or second means for, loading the credit register with a zero prior to the step of transferring the initial credit value into the credit register. Just prior to initialization in Barker, it is not clear what, exactly, the value is in the credit register but it is clear that, at initialization, the credit value of n is loaded into both the debit register and the credit register. Thus, we cannot say, with assurance, that Barker, at any time, actually loads the credit register with a zero, let alone at some time prior to the step of transferring, as required by claims 14 and 30. For similar reasons, we will not sustain the rejection of claims 3 and 19 under 35 U.S.C. 102(e) since these claims also contain the limitation of loading the credit register with a zero prior to the step of transferring.

With regard to claims 5 and 21, these claims recite further specifics regarding the transferring step, viz., that the initial credit value is placed into a packet which is bound for the first node, that the debit register is decremented by the initial credit value and the packet is sent to the first node. We find

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no such specifics, or even the suggestion of placing the initial credit value in a packet, in Barker. Accordingly, we will not sustain the rejection of claims 5 and 21, or of claims 6-13 and 22-29, dependent thereon, under 35 U.S.C. 102(e).

Since Barker does not appear to disclose each and every limitation of claims 5-16 and 21-32, we will not sustain the rejection of these claims under 35 U.S.C. 102(e).

With regard to dependent claims 2 and 18, these claims recite that the initial credit value "is equal to a size of a queue that is resident on the second node and receives information from the first node." While appellant does not specifically argue these limitations, it appears that Barker discloses this at column 4, lines 57-62, wherein it is explained how and why a certain initial value  $n$  is chosen. Thus, we will sustain the rejection of claims 2 and 18 under 35 U.S.C. 102(e).

We have not sustained the rejection of claim 14 under 35 U.S.C. 112, second paragraph, nor have we sustained the rejection of claims 3, 5-16, 19 and 21-32 under 35 U.S.C. 102(e). We have, however, sustained the rejection of claims 1, 2, 4, 17, 18 and 20 under 35 U.S.C. 102(e).

Accordingly, the examiner's decision is affirmed-in-part.

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No time period for taking any subsequent action in  
connection with this appeal may be extended under 37 CFR  
§ 1.136(a).

AFFIRMED-IN-PART

ERROL A. KRASS	)	
Administrative Patent Judge	)	
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JERRY SMITH	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	
	)	
LEE E. BARRETT	)	
Administrative Patent Judge	)	

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